Cisco Catalyst 2950 Switches with Standard Image (SI) Software

Product Overview

The Cisco Catalyst® 2950SX-24, 2950-24 and 2950-12, members of the Cisco Catalyst 2950 Series Switches, are standalone, fixed-configuration, managed 10/100 switches providing basic workgroup connectivity for small to midsized networks. These wire-speed desktop switches come with Standard Image (SI) Software features and offer Cisco IOS functionality for basic data, video and voice services at the edge of the network. Embedded in all Catalyst 2950 Series is the Cisco Cluster Management Suite (CMS) Software, which allows users to simultaneously configure and troubleshoot multiple Catalyst desktop switches using a standard Web browser.

This product line offers two distinct sets of software features and a range of configurations to allow small, midsized, and enterprise branch offices to select the right combination for the network edge. The SI software offers Cisco IOS functionality for basic data, video, and voice services. For networks with requirements for additional security, advanced quality of service (QoS), and high availability, the Enhanced Image (EI) software delivers intelligent services such as rate limiting and security filtering for deployment at the network edge.

The Catalyst 2950SX-24, 2950-12, and 2950-24 switches are only available with the SI software for the Catalyst 2950 Series.

- Catalyst 2950SX-24 Switch — 24 10/100 ports with 2 fixed 1000BASE-SX uplinks
- Catalyst 2950-24 Switch — 24 10/100 ports
- Catalyst 2950-12 Switch — 12 10/100 ports

These switches provide customers with a choice of connectivity options. While the Catalyst 2950-12 and 2950-24 provide 12 and 24 10/100 ports for edge connectivity respectively, the Catalyst 2950SX-24 provides 24 10/100 ports and 2 integrated 1000BASE-SX ports for gigabit uplink connectivity over fiber. With these integrated ports, customers get an extremely cost-effective solution for delivering gigabit speeds using fiber. Dual ports also provide redundancy and increased availability, as well as provide a cost-effective means for cascading switches and managing them as a cluster. This switch is ideal for education and government segments, where fiber uplinks are a requirement.

Other Catalyst 2950 Series Switches

The Catalyst 2950 Series Intelligent Ethernet Switches with EI Software are also part of the Catalyst 2590 Series switches. These fixed-configuration, stackable models bring intelligent services, such as advanced QoS, enhanced security, and high availability to the network edge — while maintaining the simplicity of traditional LAN switching. When a Catalyst 2950 Intelligent Ethernet Switch is combined with a Catalyst 3550 Series Switch, the solution enables IP routing from the edge to the core of the network. Refer to the Catalyst 2950 Series EI Data Sheet for more information.

Catalyst 2950 Long-Reach Ethernet (LRE) Switches

- Catalyst 2950ST-24-LRE — 24 Long-Reach Ethernet (LRE) ports and 2 fixed 10/100/1000BASE-T ports and 2 Small Form Factor Pluggable (SFP) ports (two of the four uplinks active at one time)
- Catalyst 2950ST-8-LRE — Eight LRE ports and two fixed 10/100/1000BASE-T ports and two SFP ports (two of the four uplinks active at one time)

The Cisco Catalyst 2950 LRE solution delivers cost-effective, high-performance broadband access over existing phone wiring in enterprise campus environments and multitenant buildings (for example, hotels, apartment buildings, and office buildings). The Catalyst 2950 LRE switches come with the EI Software features enabling enterprise and service provider customers to extend intelligent services over legacy wiring (category 1/2/3) to distances up to 5000 feet. Cisco is the only company with the breadth of technologies that allow customers to deliver intelligent network services across any combination of wired and wireless infrastructures. Refer to the Catalyst 2950 LRE Series Data Sheet for more information.

Key Features and Benefits

Table 21-54: Catalyst 2950 Switches with SI Software — Features and Benefits

Feature	Benefit
Availability	
Superior Redundancy for Fault Backup	IEEE 802.1D Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance. Support for Cisco Spanning-Tree Protocol enhancements such as UplinkFast, BackboneFast, and PortFast technologies ensure quick fail-over recovery enhancing overall network stability and availability. Support for Cisco's optional, 300-watt redundant AC power system provides a backup power source for up to four units for improved fault tolerance and network uptime. Provides unidirectional link detection (UDLD) and Aggressive UDLD for detecting and disabling unidirectional links on fiber-optic interfaces caused by incorrect fiber-optic wiring or port faults.
Integrated Cisco IOS Features for Bandwidth Optimization	Bandwidth aggregation through EtherChannel technology enhances fault tolerance and offers higher-speed aggregated bandwidth between switches, to routers and individual servers. Port Aggregation Protocol (PAgP) is available to simplify configuration. Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance. Per virtual LAN (VLAN) Spanning-Tree Plus (PVST+) allows for Layer 2 load sharing on redundant links to efficiently utilize the extra capacity inherent in a redundant design. VLAN Trunking Protocol (VTP) pruning limits bandwidth consumption on VTP trunks by flooding broadcast traffic only on trunk links required to reach the destination devices. Dynamic Trunking Protocol (DTP) enables dynamic trunk configuration across all ports in the switch. IGMP snooping provides for fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors. MVR, IGMP filtering and fast-join and immediate leave are available as enhancements.
Security	
Network-Wide Security Features	A private VLAN edge provides security and isolation between ports on a switch, ensuring that voice traffic travels directly from its entry point to the aggregation device through a virtual path and cannot be directed to a different port. Support for the 802.1x standard allows users to be authenticated regardless of which LAN port they are accessing, and provides unique benefits to customers who have a large base of mobile (wireless) users accessing the network. • 802.1x with voice VLAN to permit an IP phone access to the voice VLAN irrespective of the authorized or unauthorized state of the port. • 802.1x with port security for authenticating the port and managing network access for all MAC addresses, including that of the client. Port Security secures the access to a port based on the MAC address of a user's device. The aging feature removes the MAC address from the switch after a specific timeframe to allow another device to connect to the same port. MAC Address Notification allows administrators to be notified of new users added or removed from the network. Multilevel security on console access prevents unauthorized users from altering the switch configuration. Trusted Boundary provides the ability to trust the QoS priority settings if an IP phone is present and disable the trust setting in the event that the IP phone is removed, thereby preventing a rogue user from overriding prioritization policies in the network. TACACS+ and RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration. SNMPv3 (non-crypto) monitors and controls network devices, manages configurations, statistics collection, performance, and security Cisco CMS Software Security Wizards ease the deployment of security features for restricting user access to a server, a portion of the network, or access to the network.
QoS	
Layer 2 QoS	Support for reclassifying frames based either on 802.1p CoS value or default CoS value per port assigned by network manager. Four queues per egress port supported in hardware. The WRR scheduling algorithm ensures that low-priority queues are not starved. Strict priority queue configuration via Strict Priority Scheduling ensures that time-sensitive applications such as voice always follow an expedited path through the switch fabric.

Feature	Benefit
Management	
Superior Manageability	SNMP and Telnet interface support delivers comprehensive in-band management, and a command-line interface (CLI)-based management console provides detailed out-of-band management.
	An embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis.
	A SPAN port can mirror traffic from one or many ports to another port for monitoring all nine RMON groups with an RMON probe or network analyzer.
	Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by downloading from a centralized location.
	Network Timing Protocol (NTP) provides an accurate and consistent timestamp to all switches within the intranet.
	Layer 2 traceroute eases troubleshooting by identifying the physical path that a packet takes from the source device to a destination device.
	Multifunction LEDs per port for port status, half-duplex/full-duplex, 10BASE-T/100BASE-TX/1000BASE-T indication, as well as switch-level status LEDs for system, redundant power supply, and bandwidth utilization provide a comprehensive and convenient visual management system.
	Crash Information support enables switch to generate a crash file for improved troubleshooting.
	Show-interface-capabilities provides information on configuration capabilities of any interface.
	RTTMON-MIB allows users to monitor network performance between a Catalyst switch and a remote device.
Cisco CMS	Cisco CMS Software allows the user to manage up to 16 inter-connected Cisco Catalyst 3550, 2950, 3500 XL, 2900 XL, and 2900 LRE XL switches without the limitation of being physically located in the same wiring closet, and with the option of using a single IP address for the entire cluster if desired. Full backward compatibility ensures any combination of the above switches can be managed with a Cisco Catalyst 2950 switch.
	Cisco Architecture for Voice, Video and Integrated Data (AVVID) Wizards use just a few user inputs to automatically configure the switch to optimally handle different types of traffic: voice, video, multicast, and/or high-priority data.
	One-click software upgrades can be performed across the entire cluster simultaneously, and configuration cloning enables rapid deployment of networks.
	Cisco CMS Guide Mode assists users in the configuration of powerful advanced features by providing step-by-step instructions.
	Cisco CMS provides enhanced online help for context-sensitive assistance.
	Easy-to-use graphical interface provides both a topology map and front panel view of the cluster.
	Multi-device and multiport configuration capabilities allow network administrators to save time by configuring features across multiple switches and ports simultaneously.
	Ability to launch the Web-based management for a Cisco Aironet Wireless Access Point by simply clicking on its icon in the topology map.
	User-personalized interface allows users to modify polling intervals, table views, and other settings within CMS and retain these settings the next time they use CMS.
	Alarm notification provides automated e-mail notification of network errors and alarm thresholds.
Support for CiscoWorks	Manageable through CiscoWorks network management software on a per-port and per-switch basis providing a common management interface for Cisco routers, switches, and hubs.
	SNMP v1, v2, and v3 (non-crypto) and Telnet interface support delivers comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management.
	Cisco Discovery Protocol (CDP) Versions 1 and 2 enable a CiscoWorks network management station to automatically discover the switch in a network topology.
	Supported by the CiscoWorks 2000 LAN Management Solution.

Feature	Benefit
Ease of Use and Ease of Deployment	Auto-configuration eases deployment of switches in the network by automatically configuring multiple switches across a network via a bootp server.
	Auto-sensing on each port detects the speed of the attached device and automatically configures the port for 10- or 100-operation, easing the deployment of the switch in mixed 10- and 100BASE-T environments.
	Auto-negotiating on all ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.
	Link Aggregation Control Protocol (LACP) allows the creation of Ethernet channeling with devices that conform to IEEE 802.3ad. This is similar to Cisco's EtherChannel and PAgP.
	Cisco CDP Versions 1 and 2 enable a CiscoWorks network management station to automatically discover the switch in a network topology.
	Cisco VTP supports dynamic VLANs and dynamic trunk configuration across all switches.
	Support for dynamic VLAN assignment through implementation of VLAN Membership Policy Server (VMPS) client functionality provides flexibility in assigning ports to VLANs.
	Voice VLAN simplifies telephony installations by keeping voice traffic on a separate VLAN for easier network administration and troubleshooting.
	The default configuration stored in Flash ensures that the switch can be quickly connected to the network and can pass traffic with minimal user intervention.

Specifications

Hardware

Table 21-55: Technical Specifications for Catalyst 2950 Series Switches with SI Software

Description	Specification
Performance	8.8-Gbps switching fabric
	Catalyst 2950-12: 2.4-Gbps maximum forwarding bandwidth
	Catalyst 2950-24: 4.8-Gbps maximum forwarding bandwidth
	Catalyst 2950SX-24: 8.8-Gbps maximum forwarding bandwidth
	• (Forwarding Rates based on 64-byte packets)
	Catalyst 2950-12: 1.8-Mpps wire-speed forwarding rate
	Catalyst 2950-24: 3.6-Mpps wire-speed forwarding rate
	Catalyst 2950SX-24: 6.6-Mpps wire-speed forwarding rate
	8-MB packet buffer memory architecture shared by all ports
	16-MB DRAM and 8-MB Flash memory
	Configurable up to 8000 MAC addresses

Description	Specification
Management	BRIDGE-MIB
	CISCO-2900-MIB
	CISCO-BULK-FILE-MIB
	CISCO-CDP-MIB
	CISCO-CLASS-BASED-QOS-MIB
	CISCO-CLUSTER-MIB
	CISCO-CONFIG-COPY-MIB
	CISCO-CONFIG-MAN-MIB
	CISCO-ENVMON-MIB
	CISCO-FLASH-MIB
	CISCO-FTP-CLIENT-MIB
	CISCO-IMAGE-MIB
	CISCO-IPMROUTE-MIB
	CISCO-MAC-NOTIFICATION-MIB
	CISCO-MEMORY-POOL-MIB
	CISCO-PAGP-MIB
	CISCO-PING-MIB
	CISCO-PROCESS-MIB
	CISCO-PRODUCTS-MIB
	CISCO-RTTMON-MIB
	CISCO-SMI
	CISCO-STACKMAKER-MIB
	CISCO-STP-EXTENSIONS-MIB
	CISCO-SYSLOG-MIB
	CISCO-TC
	CISCO-TCP-MIB
	CISCO-VLAN-MEMBERSHIP-MIB
	CISCO-VTP-MIB
	ENTITY-MIB
	IANAifType-MIB
	IF-MIB (RFC 1573)
	OLD-CISCO-CHASSIS-MIB
	OLD-CISCO-CPU-MIB
	OLD-CISCO-INTERFACES-MIB
	OLD-CISCO-IP-MIB
	OLD-CISCO-MEMORY-MIB
	OLD-CISCO-SYSTEM-MIB
	OLD-CISCO-TCP-MIB
	OLD-CISCO-TS-MIB
	RFC1213-MIB (MIB-II)
	RFC1398-MIB (ETHERNET-MIB)
	RMON-MIB (RFC 1757)
	RS-232-MIB
	SNMPv2-MIB
	SNMPv2-SMI
	SNMPv2-TC
	TCP-MIB
	UDP-MIB

Description	Specification
Standards	IEEE 802.1x support IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports IEEE 802.1D Spanning-Tree Protocol IEEE 802.1p CoS prioritization IEEE 802.1Q VLAN IEEE 802.3 10BASE-T specification IEEE 802.3u 100BASE-TX specification IEEE 802.3ad IEEE 802.3z 1000BASE-X specification
Y2K	Y2K compliant
Connectors and Cabling	10BASE-T ports: RJ-45 connectors, two-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling 100BASE-TX ports: RJ-45 connectors; two-pair Category 5 UTP cabling 1000BASE-SX ports: MT-RJ connectors, 50/125 or 62.5/125 micron multimode fiber-optic cabling Management console port: 8-pin RJ-45 connector, RJ-45-to-DB9 adapter cable for PC connections; for terminal connections, use RJ-45-to-DB25 female data-terminal-equipment (DTE) adapter (can be ordered separately from Cisco, part number ACS-DSBUASYN=)
MT-RJ Patch Cables for Catalyst 2950SX-24 Switch	Type of Cable ---------- Cisco Part Number • 1-meter, MT-RJ-to-SC multimode cable - - - - - - - CAB-MTRJ-SC-MM-1M • 3-meter, MT-RJ-to-SC multimode cable - - - - - - - CAB-MTRJ-SC-MM-3M • 5-meter, MT-RJ-to-SC multimode cable - - - - - - - CAB-MTRJ-SC-MM-5M • 1-meter, MT-RJ-to-ST multimode cable - - - - - - - CAB-MTRJ-ST-MM-1M • 3-meter, MT-RJ-to-ST multimode cable - - - - - - - CAB-MTRJ-ST-MM-3M • 5-meter, MT-RJ-to-ST multimode cable - - - - - - - CAB-MTRJ-ST-MM-5M
Indicators	Per-port status LEDs: link integrity, disabled, activity, speed, and full-duplex indications System status LEDs: system, RPS, and bandwidth utilization indications
Mean Time Between Failure (MTBF) — Predicted	• 268,292 hours (Catalyst 2950-24) • 318,440 hours (Catalyst 2950-12) • 403,214 hours (Catalyst 2950SX-24)

Table 21-56: Cables and Accessories for Catalyst 2950 Switches with SI Software

Product Name	Description
1 RU Catalyst Rack Mount Kit	Rack mount kit for 1 RU versions of Catalyst 2950, 3500 XL, 2900 XL switches
Cisco Redundant Power System 300 (RPS 300)	Cisco Redundant Power System 300 (RPS 300) with 1 connector cable
1.2 meter cable for Cisco RPS 300 to external device connection	1.2 meter cable for Cisco RPS 300 to external device connection

Table 21-57: Power Specifications for Catalyst 2950 Switches with SI Software

Description	Specification
Power Connectors	Customers can provide power to a switch by using either the internal power supply or the Cisco Redundant Power System (RPS) 300. The connectors are located at the back of the switch. Internal Power Supply Connector • The internal power supply is an auto-ranging unit. • The internal power supply supports input voltages between 100 and 240 VAC. • Use the supplied AC power cord to connect the AC power connector to an AC power outlet. Cisco RPS Connector • The connector offers connection for an optional Cisco RPS 300 that uses AC input and supplies DC output to the switch. • The connector offers a 300-watt redundant power system that can support six external network devices and provides power to one failed device at a time. • The connector automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Attach only the Cisco RPS 300 (model PWR300-AC-RPS-N1) to the redundant-power-supply receptacle.
Internal Power Supply Connector	• The internal power supply is an auto-ranging unit. • The internal power supply supports input voltages between 100 and 240 VAC. • Use the supplied AC power cord to connect the AC power connector to an AC power outlet. • Cisco RPS Connector • The connector offers connection for an optional Cisco RPS 300 that uses AC input and supplies DC output to the switch. • The connector offers a 300-watt redundant power system that can support six external network devices and provides power to one failed device at a time. • The connector automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Attach only the Cisco RPS 300 (model PWR300-AC-RPS-N1) to the redundant-power-supply receptacle.
Cisco RPS Connector	• The connector offers connection for an optional Cisco RPS 300 that uses AC input and supplies DC output to the switch. • The connector offers a 300-watt redundant power system that can support six external network devices and provides power to one failed device at a time. • The connector automatically senses when the internal power supply of a connected device fails and provides power to the failed device, preventing loss of network traffic. • Attach only the Cisco RPS 300 (model PWR300-AC-RPS-N1) to the redundant-power-supply receptacle
Power Requirements	Power consumption: 30W (maximum), 102 BTUs per hour
	AC input voltage/frequency: 100 to 127 or 200 to 240 VAC (auto-ranging), 50 to 60 Hz
	DC Input Voltages for Cisco RPS 300 Redundant Power System (RPS): +12V @ 4.5A

Table 21-58: Physical and Environmental Specifications for Catalyst 2950 Switches with SI Software

Description	Specification
Dimensions (H x W x D)	1.72 x 17.5 x 9.52 in. (4.36 x 44.45 x 24.18 cm)
	One rack-unit (RU) high (1.72 in./4.36 cm)
Weight	6.5 lbs (3.0 kg)
Operating temperature	32 to 113˚F (0˚ to 45˚C)
Storage temperature	-13 to 158˚F (-25 to 70˚C)
Operating relative humidity	10 to 85% (non-condensing)
Operating altitude	Up to 10,000 ft (3,000 m)
Storage Altitude	Up to 15,000 ft (4,500 m)
Warranty	Limited lifetime warranty

Description	Specification
Acoustic Noise	ISO 7770, bystander position-operating to an ambient temperature of 30 degrees Celsius: • WS-C2950-24, WS-C2950-12, WS-C2950C-24, WS-C2950T-24: 46dBa • WS-C2950G-12, WS-C2950G-24: 46 dBa • WS-C2950G-48: 48 dBa

Table 21-59: Regulatory Approvals for Catalyst 2950 Switches with SI Software

Description	Specification
Safety Certifications	• UL 60950/CSA 22.2 No. 950 • IEC 60950/EN 60950 • AS/NZS 3260, TS001 • CE Marking
Electromagnetic Emissions Certifications	• FCC Part 15 Class A • EN 55022: 1998 (CISPR 22) Class A • EN 55022: 1998 (CISPR 22) • VCCI Class A • AS/NZS 3548 Class A • CE Marking • CNS 13438 Class A • CLEI Code • MIC

Software

N/A

Ordering Information

Product Part Numbers

All part descriptions and part numbers for Cisco products can be accessed using the online Cisco Pricing Tool at

http://www.cisco.com/cgi-bin/front.x/pricing

The Cisco Pricing Tool requires a user name and password. If you are not already registered, go to

http://www.cisco.com/register and follow the instructions. After you have registered, you may access the Pricing Tool.

Documentation

For more product specific documentation, visit

http://www.cisco.com/go/catalyst2950